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VENABLE, BAETJER, HOWARD AND CIVILETTI, LLP  
P.O. BOX 34385  
WASHINGTON, DC 20043-9998

EXAMINER

SUMMONS, BARBARA

ART UNIT PAPER NUMBER

2817

DATE MAILED: 06/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/785,501

Applicant(s)

Komazaki et al.

Examiner

Barbara Summora

Group Art Unit

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—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 (three) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

☒ Responsive to communication(s) filed on 2/20/03

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

☒ Claim(s) 21-27, 29, 30, and 32-48

is/are pending in the application.

Of the above claim(s) \_\_\_\_\_

is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_

is/are allowed.

☒ Claim(s) 21-25, 29, 30, 32-38, and 41-48

is/are rejected.

☒ Claim(s) 26, 27, 39, 40

is/are objected to.

☐ Claim(s) \_\_\_\_\_

are subject to restriction or election requirement

## Application Papers

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some\* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_

☐ Copies of the certified copies of the priority documents have been received

in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 11/2

☐ Interview Summary, PTO-413

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other \_\_\_\_\_

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**DETAILED ACTION**

***Specification***

1. The substitute specification received 2/20/03 has been approved and entered.

***Response to Amendment***

2. It should be noted that although Applicants indicated that a substitute Abstract had been provided (see e.g. page 6 of the amendment received 2/20/03 and page 5 of the marked-up copy), the amended/substitute Abstract cannot be found. There is a strangely blank page on page 6 of the marked-up copy of the amendment. Perhaps this is where the Abstract was supposed to be placed. As of now, the original Abstract is still the Abstract of record.

3. Applicants attached list of the renumbered claims was not useful, as it was impossible for the tech staff to enter, because it included canceled claims and did not include the amendments to the claims provided on pages 2-6 of the amendment. What the Examiner was requesting was a complete list of the claims including all amendments(past and present) so that the list could replace all preceding amendments which are all over the place and have misnumbered claims. This will reduce possible errors in the printing process.

Applicants may wish to provide such a list of claims with the next amendment. For example:

21. (Amended) Text of claim...
22. (Amended) Text of claim...
23. (Original) [i.e. since it was submitted with the pre-amend. on the filing date of 2/20/01] Text of claim....

:

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28. (canceled).

29. (Amended) Text of claim...

etc...

In other words do not submit a list of the claims, and then another list of amendments which must be inserted into the first mentioned list. This is like submitting two amendments at once. Do submit a list of the claims in their most updated form including amendments you will make in response to this Office action. If these comments are unclear feel free to call the Examiner.

***New Grounds of Claim Objections***

4. Claim 41 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. It appears that claim 41 should have been canceled because its subject matter is recited in claims 34 and 35.

***New Grounds of Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 29, 30 and 32 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Each of Claims 29 and 32 are unclear because they depend from a canceled claim (i.e. claim 1). The Examiner will assume claims 29 and 32 are intended to depend from claim 21 in any art rejections that may follow.

Claim 30 is unclear because it recites that the "branching filter circuit" is "on the common piezoelectric substrate" (see Ins. 2-3), but the claim it depends from (i.e. claim 27) recites that the "branching filter circuit" is "formed on the first layer substrate or the second layer substrate" of the "package" (see claim 27, Ins. 2-4). Is the branching filter circuit on the piezoelectric substrate or the package substrates? Is the dependency of claim 30 incorrect? Is only the "frequency adjusting circuit" intended to be on the piezoelectric substrate (see e.g. claim 43)?

It should be noted that the claim tree of the first set of claims depending from independent claim 21 and the claim tree of the second set of claims depending from independent claim 34 do not match. For example, claim 25 depends from a dependent claim 22, while equivalent claim 38 depends from its independent claim 34. Similarly, see the dependencies of claims 39 and 40 vs. equivalent claims 26 and 27. Applicants are urged to verify the dependencies of all of the claims.

### ***New Grounds of Double Patenting***

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686

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F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 21-25, 29, 30, 34-38, and 41-43 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 5 of U.S. Patent No. 6,222,426 in view of Ikada U.S. 6,057,744 (of record).

Claim 5 of U.S. '426 recites every element of the claims of the instant application including a SAW transmitting filter, SAW receiving filter, frequency adjusting circuit including capacitance (i.e. an "LC circuit") and a branching filter circuit including a serial arm SAW resonator (see '426 claim 1) all on the same piezoelectric substrate and connected as recited.

However, Claim 5 of U.S. '426 lacks a package with the antenna, receiving and transmitting terminals formed thereon.

Ikada is one of numerous prior art references which show that it is known to place such SAW duplexer (a.k.a. branching filter) devices in multi-layer packages with the terminals formed on the package (see Fig. 5).

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Therefore, it would have been obvious to one of ordinary skill in the art to have packaged the SAW duplexer of Claim 5 of the '426 Patent in a multi-layered package with the terminals formed on the package in view of the exemplary teaching thereof by (Fig. 5), and because such an obvious modification would have provided the advantageous benefits, and indeed for SAW devices the requirement, of protection from environmental factors such as dust, shock and moisture, as would have been known by one of ordinary skill.

***New Grounds of Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 21-25, 29, 34-38, 41, 44, 47, and 48 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ikada U.S. 6,057,744 (of record) in view of Igata et al. JP 5-167388 (of record).

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Figs. 3-5 of Ikada disclose a SAW duplexer. Note that although a diplexer is shown, it is disclosed that the connections can be changed such that the device is a duplexer with a transmitting and a receiving filter (see col. 9, lns. 28-36). The duplexer having an antenna terminal (corresponding to bonding pad OUT), a transmitting terminal (e.g. corresponding to bonding pad IN1) and a receiving terminal (e.g. corresponding to bonding pad IN2), comprising: a transmitting SAW filter 22 coupled between the antenna terminal OUT and the transmitting terminal IN1; a receiving SAW filter 23 coupled between the antenna terminal OUT and the receiving terminal IN2; a common piezoelectric substrate 31 on which both SAW filters 22 and 23 are formed; a package 35 (Fig. 5) covering the common piezoelectric substrate, wherein the antenna terminal, transmitting terminal and receiving terminal corresponding to the bonding pads on the piezoelectric substrate, although unseen in Fig. 5, are inherently formed on the package 35 for wire bonding by wires 36a and 36b; and a frequency adjusting circuit 28 coupled between the antenna terminal and the transmitting SAW filter or receiving SAW filter. Regarding claims 22-24, 35-37, and 41, a branching filter circuit composed of serial arm SAW resonators 25-27 is coupled between the frequency adjusting circuit 28 and the transmitting or receiving SAW filters 22 and 23, such that the frequency adjusting circuit 28 is coupled between the antenna terminal OUT and the branching filter circuit 25-27, and the branching filter circuit is formed on the same substrate 31. Regarding claims 25, 38, and 44, the package 35 has a multi layered structure a-c.

However, Ikada does not show the frequency adjusting circuit having a capacitance element (claims 21 and 34) that is coupled in series between the antenna terminal and the transmitting or receiving SAW filter (see new claims 47 and 48).

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Igata JP 5-167388 discloses that it is extremely well known in the impedance matching circuit in duplexers art, that an impedance matching circuit with only an inductor is interchangeable with an impedance matching circuit with a series capacitor along with an inductor (see Fig. 3 vs. Fig. 5), and such an arrangement provides the benefit of more exact impedance matching as suggested by Igata (see section [0032] of the attached machine translation).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the duplexer of Ikada by having substituted an impedance matching/frequency adjusting circuit having a series capacitance element and an inductor as taught, for example, by Igata (Fig. 5), in place of the inductor only impedance matching/frequency adjusting circuit 28 of Ikada (Fig. 3), because such an obvious modification would have been the mere substitution of art recognized alternate interchangeable impedance matching/frequency adjusting circuits as suggested by Igata (see Fig. 3 vs. Fig. 5), and would have provided the advantageous benefit of more exact impedance matching as suggested by Igata (section [0032]).

11. Claims 21-24, 29, 34-37, 41-43, 47 and 48 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Oguri et al. JP 11-68512 in view of Ikada U.S. 6,057,744 (of record).

Regarding claims 21, 34, 47, and 48, Figs. 1, 5 and 6 of Oguri et al. discloses a SAW diplexer (i.e. two transmitting frequencies or two receiving frequencies)[see the abstract, lns. 1-3) comprising: two SAW filters Fil1 and Fil2; a common piezoelectric substrate 16 (Fig. 5) on which both the SAW filters are formed; a package (Fig. 6) covering the common piezoelectric substrate and upon which the terminals for the antenna and the filters must inherently be formed;

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and a frequency adjusting circuit having a capacitance element C connected in series between the SAW filters and the antenna terminal. Regarding claims 22-24, 35-37, 41, and 43, the diplexer also has branching circuit series arm SAW resonators Reso1 and Reso2 that are coupled between the frequency adjusting circuit C and the SAW filters, and the branching circuit resonators are formed on the common piezoelectric substrate along with the frequency adjusting circuit C (see Fig. 5 and the abstract, the last three lines thereof). Regarding claims 29 and 42, the frequency adjusting circuit also includes an inductor L.

However, Oguri et al. discloses a diplexer rather than a duplexer having a transmitting SAW filter and receiving SAW filter.

Ikada discloses that it is known to convert diplexers to duplexers depending on the system requiring a dual band transmitter, dual band receiver, or a transceiver (see col. 9, lns. 28-36).

Consequently, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the diplexer of Oguri (Figs. 1, 5, and 6) such that it would have been a duplexer wherein filters Fil1 and Fil2 would have been one transmitting filter and one receiving filter because such an obvious modification would have required only routine skill and would have been dependent upon system requirements as explicitly suggested by Ikada (col. 9, lns. 28-36).

12. Claims 32, 33, 45 and 46 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ikada U.S. 6,057,744 (of record) in view of Igata JP 5-167388 (of record) as applied to claims 21 and 34 above, and further in view of Hirasawa et al. JP 6-97761 (of record).

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The Ikada/Igata combination discloses the invention as discussed above, except for the frequency adjusting circuit being formed on the package in first or second layers thereof.

Hirasawa et al. discloses that it would have been well known to provide LC circuits in the layers of a SAW filter package (see Figs. 4 and 9) as admitted by Applicants (see the sub spec. at page 3, lines 17-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Ikada/Igata combination such that the frequency adjusting/impedance matching circuit 28 (Ikada Fig. 3) comprised of a series capacitance element and an inductor (Igata Fig. 5) would have been provided in a first or second layer of the package (see layers a/b or b/c in Ikada Fig. 5) because such an obvious modification of providing LC circuits in package layers would have been well known in the SAW duplexer art in view of the exemplary teaching of Hirasawa (e.g. Figs. 4 and 9), and would have provided the benefits of miniaturization and elimination of external circuit elements as suggested by Hirasawa (see the abstract, lns. 1-5). Furthermore, the combination will not have the drawbacks Applicants attribute to Hirasawa alone (see the sub. spec. page 3, the last paragraph), because the Ikada/Igata combination has the branching filter circuit series SAW resonators and the SAW transmitting and receiving filters formed on the piezoelectric substrate so only the LC circuit is within the package.

***Allowable Subject Matter***

13. Claims 26, 27, 39, and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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14. The following is a statement of reasons for the indication of allowable subject matter:

In cases where the prior art of record discloses a SAW transmitting and SAW receiving filter on the same substrate and includes a branching filter circuit and a frequency adjusting (a.k.a. impedance matching circuit), the branching filter circuit is formed of SAW resonators and so they could not be formed on the package or in the layers thereof.

***Response to Arguments***

15. Applicant's arguments with respect to claims 21 and 34 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

16. Note that because the Double Patenting rejection was not previously applied and should have been, this Office action is not being made Final.

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nishihara et al. JP 9-98046 discloses (see Fig. 3) a SAW branching filter having two SAW filters F1 and F2, branching filter circuits I1 and I2 and a frequency adjusting circuit with a capacitance element C5 all formed to be in the same package (see Fig. 8).

18. Any inquiry concerning this communication should be directed to Barbara Summons at telephone number (703) 308-4947, FAX no. (703) 308-7724, receptionist's no. (703) 308-0956, Supervisory Examiner Bob Pascal (703) 308-4909.



Barbara Summons  
Primary Examiner  
Art Unit 2817

bs  
June 16, 2003